

## Oral Presentation – Abstract 0424

# Rate of viral load failure over time in people on ART in the UK Collaborative HIV Cohort (CHIC) study

O'Connor, Jemma<sup>1</sup>; Smith, Colette<sup>1</sup>; Lampe, Fiona<sup>1</sup>; Johnson, Margaret<sup>2</sup>; Sabin, Caroline<sup>1</sup> and Phillips, Andrew<sup>1</sup>

<sup>1</sup>Department of Infection and Population Health, UCL, London, UK. <sup>2</sup>Ian Charleson Day Centre, Royal Free Hampstead NHS Trust, London, UK.

**Introduction:** Most people achieve and maintain viral load (VL) suppression on first-line antiretroviral therapy (ART) but for a minority this does not happen. It is unclear whether those who have maintained VL suppression for several years will be able to continue to do so, or if rates of VL failure – due to poor adherence, ART interruption and/or resistance – remain at appreciable levels.

**Methods:** Eligible participants were ART-naïve and started treatment after 1st January 2000, with  $\geq 3$  antiretrovirals and  $\geq 9$  months follow-up. VL failure was defined as failure to achieve VL suppression ( $\leq 50$  copies/mL) by 9 months on ART or a single VL  $> 200$  copies/mL after 9 months after start of ART. Kaplan-Meier estimates were used to examine the cumulative probability of experiencing a VL  $> 200$  copies/mL over time, irrespective of treatment interruption (Figure 1). Follow-up was censored at last VL assessment but not at treatment interruption. In a sensitivity analysis, VL failure was instead defined as two consecutive VL  $> 1000$  copies/mL.

**Results:** A total of 13,556 participants were included. Median (IQR) age at start of ART was 37 (32–43), median follow-up 4.1 (2.3–6.7) years, pre-ART VL 71,400 (17,400–221,900) copies/mL and pre-ART CD4 count 204 (110–290) cells/mm<sup>3</sup>. Fifty-one percent were white, 71% male and 50% MSM. Of which, 5,351 (39%) participants experienced a VL  $> 200$  copies/mL. In sub-groups of participants the proportion experiencing a VL  $> 200$  copies/mL by one year after start of ART were: <50 years 22%,  $\geq 50$  years 17%, men 20%, women 26%, MSM 19%, black heterosexuals 23%, white heterosexuals 26% and other 23%. The median time to VL  $> 200$  copies/ml was 8 years. In sensitivity analyses based on 12,811 participants, 4274 (33%) experienced two consecutive VL  $> 1000$  copies/mL. Table 1 presents the rate of experiencing a VL  $> 200$  copies/mL (two consecutive VL  $> 1000$  copies/mL) by time since start of ART. The rate of VL  $> 200$  copies/mL declines over time, from 30 per 100 person-years after up to two years after ART, to two per 100 person-years after up to 11.5 years after ART. A sum of 2,047 (15%) participants stopped ART at some point (10, 14 and 17% had stopped ART by 1, 3, and 5 years, respectively).

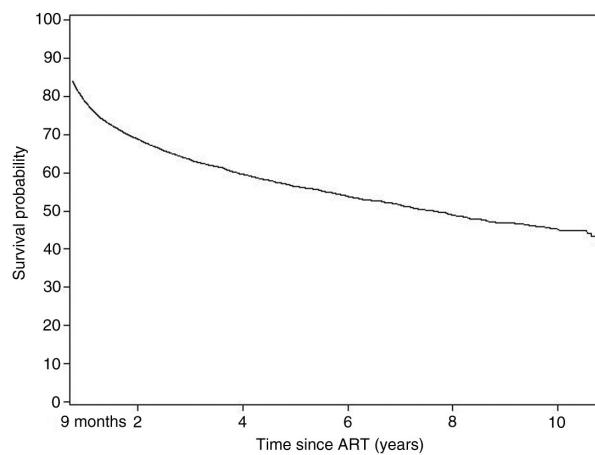
**Conclusions:** Although resistance will often not be present and, even if present, several drug options will likely remain, first occurrence of VL  $> 200$  copies/mL after having attained viral suppression continues to occur after 10 years on ART.

**Table 1. Rate per 100 person-years of viral load failure over time since start of ART**

Follow-up on ART, years (x)	Single VL $> 200$ copies/mL (two consecutive VL $> 1000$ copies/mL)			Rate of VL failure per 100 person-years	95% confidence interval for rate of VL failure
	Number in risk set at start of period	Number of VL failures during period			
0x $\leq$ 2	13,556 (12,811)	4,075 (3,376)		30.1 (26.4)	29.2–30.8 (25.6–27.1)
2x $\leq$ 4	7,310 (7,710)	801 (577)		11.0 (7.5)	10.3–11.7 (6.9–8.1)
4x $\leq$ 6	3,992 (4,434)	305 (204)		7.6 (4.6)	7.2–8.8 (4.0–5.2)
6x $\leq$ 8	2,085 (2,426)	128 (89)		6.1 (3.7)	5.0–7.0 (2.9–4.4)
8x $\leq$ 10	805 (980)	38 (26)		4.7 (2.7)	3.5–6.5 (1.6–3.7)
10x $\leq$ 11.5	179 (220)	4 (2)		2.2 (0.9)	0.4–3.8 (0.1–2.4)

Published 2 November 2014

**Copyright:** © 2014 O'Connor J et al; licensee International AIDS Society. This is an Open Access article distributed under the terms of the Creative Commons Attribution 3.0 Unported (CC BY 3.0) License (<http://creativecommons.org/licenses/by/3.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.



**Figure 1. Kaplan-Meier plot of time to viral load failure (single VL >200 copies/mL) since initiation of ART.**